REMARKS

In view of the above-amendments and the following remarks, reconsideration and further examination are requested.

The specification and abstract have been amended and replaced with the attached substitute specification, which indicates the changes with bracketing and underlining as required for reissue applications. No new matter has been added.

Claims 22-29 were provisionally rejected under the doctrine of obviousness-type double patenting as being unpatentable over the claims of copending applications nos. 09/686,465, 09/686,466, 09/686,464, 09/686,463, and 09/688,028. These rejections are traversed.

Applications 09/688,028, 09/686,464, and 09/686,465

The claims in applications nos. 09/688,028, 09/686,464, and 09/686,465 have been substantially amended and are quite dissimilar to the claims of the present application. Representative claims of the currently pending claims from these applications are reproduced as follows for the convenience of the Examiner:

09/688,028:

32. A signal receiving apparatus for use with a display device, said apparatus comprising:

- a receiver operable to receive a modulated signal having information of a data stream, wherein the modulated signal includes a digital modulated signal;

- a demodulator operable to demodulate the digital modulated signal to the data steam;

- a video decoder operable to decode the data stream to a video signal having a served format with an aspect ratio of 16:9; and

- an aspect ratio changing circuit operable to change a format of the video signal to a format other than the served format when an aspect ratio of the display device is 4:3.

09/686,464:

32. A signal transmission system comprising a transmission apparatus and a receiving apparatus,

said transmission apparatus comprising:

- a mapper operable to map a data stream to produce a mapped signal;

- a selector operable to select between tap coefficients for a VSB modulation mode and tap coefficients for a QAM modulation mode;

- first and second FIR filters operable to filter the mapped signal to produce a VSB modulated signal when said selector selects the tap coefficients for the VSB modulation mode and to produce a QAM modulated signal when said selector selects the tap coefficients for the QAM modulation mode; and

- a transmitter operable to transmit at least one of the VSB modulated signal and the QAM modulated signal; and

said receiving apparatus comprising:

- a receiver operable to receive a transmitted signal;

- a selector operable to select between tap coefficients for a VSB demodulation mode and tap coefficients for a QAM demodulation mode;

- first and second FIR filters operable to filter, when said selector selects the tap coefficients for the VSB demodulation mode, the VSB modulated signal to produce a mapped signal of the VSB modulated signal, and to filter, when said selector selects the tap coefficients for the QAM demodulation mode, the QAM modulated signal to produce a mapped signal of the QAM modulated signal; and

- a de-mapper operable to de-map at least one of the mapped signal of the VSB modulated signal and the mapped signal of the QAM modulated signal to produce the data stream.

09/686,465:

32. A signal receiving apparatus capable of receiving a VSB modulated signal processed by digital modulation and a QAM modulated signal processed by digital modulation, which are a

terrestrial broadcasting signal and a cable television signal, respectively, said signal receiving apparatus comprising:

a mixer operable to convert the VSB modulated signal to a low frequency signal of the VSB modulated signal, and operable to convert the QAM modulated signal to a low frequency signal of the QAM modulated signal;

a QAM demodulator operable to demodulate the low frequency signal of the QAM modulated signal to a QAM demodulated signal; and

a VSB demodulator operable to demodulate the low frequency signal of the VSB modulated signal to a VSB demodulated signal.

It is submitted that upon a review of the claims of applications nos. 09/688,028, 09/686,464, and 09/686,465, the Examiner will agree that the provisional double patenting rejections based on the claims of these applications is no longer applicable to the claims in the present application.

Applications 09/686,463 and 09/686,466

The present application claims that **a distance in the vector space diagram between any closest two signal points in each signal point group is less than 2δ**. See the last paragraph of claims 22, 24, 26, and 28 for this recitation. The 09/686,463 and 09/686,466 applications do not claim this feature, but instead claim different inventions.

Please see Fig. 99 of the present application, which graphically illustrates the above-mentioned recitation. Also, please see column 37. Thus, points 83a, 84a, and 86a are shifted to points 83, 84, and 86, respectively, but point 85 is not shifted. This is the feature discussed above and claimed in claims 22, 24, 26, and 28, namely, the distance in the vector space diagram between any closest two points in each signal point group is less than 2δ.

Representative claims of the currently pending claims of applications 09/686,463 and 09/686,466 are reproduced as follows for the convenience of the Examiner:

09/686,463:

22. A signal transmission apparatus comprising:

- a modulator operable to modulate a carrier wave with an input signal to produce a modulated signal, and

- a transmitter operable to transmit the modulated signal,

said input signal containing a first data stream including g values of bit patterns and a second data stream, where g is an integer number, and

the modulated signal having symbols, each of which is representing one of m signal points in a vector space diagram, where m is an integer number and the vector space diagram includes an I axis and a Q axis extending in directions perpendicular to each other,

said modulator operable to divide said m signal points into g signal point groups, assign the g values of the first data stream to the g signal point groups respectively, assign data of the second data stream to signal points of each of the g signal point groups, and select the signal points in the vector space diagram according to said input signal, so that:

said m signal points are distinguishable from one another in the vector space diagram by a first set of thresholds dividing the vector space diagram into m regions, and the g signal point groups are distinguishable from one another in the vector space diagram by a second set of thresholds dividing the vector space diagram more coarsely than the first set of thresholds into g regions,

signal points in each of said signal point groups are allocated in the vector space diagram at equal intervals,

a distance in the vector space diagram between any closest two signal points of any adjacent two signal point groups is $2\delta \times n$, where n is a shift value which is more than 1 and 2δ represents a distance in the vector space diagram between any adjacent two signal points of the m signal points when the m signal points are allocated in the vector space diagram at equal intervals in the I axis and Q axis directions of the vector space diagram, and

said signal transmission apparatus operable to transmit an information of the value m.

09/686,466:

22. A signal transmission apparatus comprising:

- a modulator operable to modulate a carrier wave with an input signal to produce a modulated signal, and

- a transmitter operable to transmit the modulated signal,

said input signal containing a first data stream including g values of bit patterns and a second data stream, where g is an integer number, and

the modulated signal having symbols, each of which is representing one of m signal points in a vector space diagram, where m is an integer number and the vector space diagram includes an I axis and a Q axis extending in directions perpendicular to each other,

said modulator operable to divide said m signal points into g signal point groups, assign the g values of the first data stream to the g signal point groups respectively, assign data of the second data stream to signal points of each of the g signal point groups, and select the signal points in the vector space diagram according to said input signal, so that:

said m signal points are distinguishable from one another in the vector space diagram by means of a first set of thresholds dividing the vector space diagram into m regions, and the g signal point groups are distinguishable from one another in the vector space diagram by means of a second set of thresholds dividing the vector space diagram more coarsely than the first set of thresholds into g regions,

signal points in each of said signal point groups are allocated in the vector space diagram at equal intervals,

a distance in the vector space diagram between any closest two signal points of any adjacent two signal point groups is $2\delta \times n$, where n is a shift value which is more than 1 and 2δ represents a distance in the vector space diagram between any adjacent two signal points when the m signal points are allocated in the vector space diagram at equal intervals in the I axis and Q axis directions of the vector space diagram, and

said signal transmission apparatus operable to transmit an information for determining at least the first set of thresholds.

Applications 09/686,463 and 09/686,466 do not recite the feature of **a distance in the vector space diagram between any closest two signal points in each signal point group is less than 2δ** as recited in claims 22, 24, 26, and 28 of the present application. Rather, application 09/686,463 recites a system in which information of a value of m is transmitted, which enables the receiving side of the system to determine the number of signal points in the vector space diagram that are represented in the modulated signal. The 09/686,466 application recites a system in which information for determining at least the first set of thresholds is transmitted, wherein the threshold divides the vector space diagram into a number of regions and the determination of the threshold enables the system to distinguish the signal points from one another in the vector space diagram.

Thus, while the present specification discloses many inventive features, the present application, the 09/686,463 application, and the 09/686,466 application each claim different inventive features. It is submitted that each of the inventive features recited in the present application, and the 09/686,463 and 09/686,466 applications, is non-obvious in view of the others. Moreover, the claims in the present application, the 09/686,463 application, or the 09/686,466 application have not been rejected on the basis of prior art, and the Examiner has indicated that the prior art does not disclose the claimed invention. The Examiner states that omitting an element from the claimed inventions of applications 09/686,463 or 09/686,466 would have been obvious. But the claims of these three applications are not related in such a manner; each application recites a different feature. Merely omitting some feature from any one application does not result in the invention recited in either of the remaining two applications.

In view of the above, it is clear that the claims of the present application should be allowed because (1) the Examiner indicated that the prior art does not disclose the inventions claimed in the present application, and (2) none of the applied copending applications claim the feature recited in the present claims and discussed in detail above. Therefore, the application is in condition for allowance.

The Examiner is invited to contact the undersigned attorney by telephone to resolve any remaining issues.

Respectfully submitted,

Mitsuaki OSHIMA et al.

By: _____

Jeffrey R. Filipek
Registration No. 41,471
Attorney for Patentees

JRF/fs
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
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